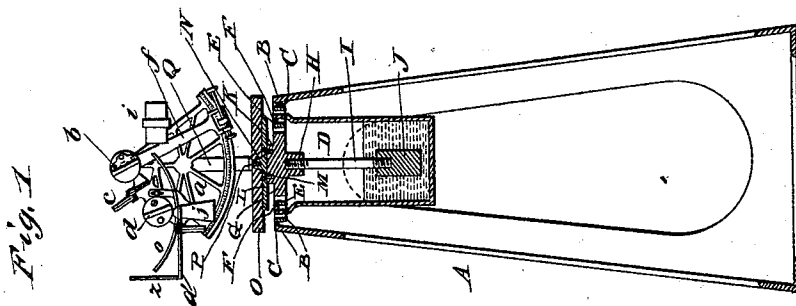
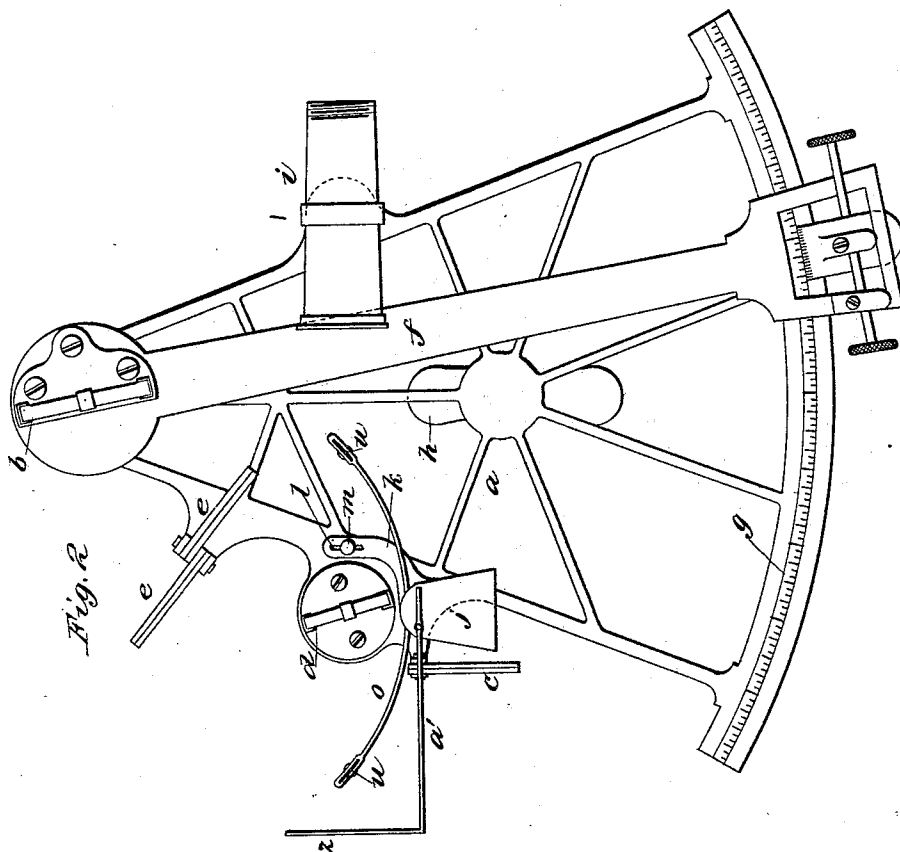


2 Sheets—Sheet 1.

Patented Aug. 6, 1895.



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(No Model.)

2 Sheets—Sheet 2.

S. M. W. CROSKERY.
ATTACHMENT FOR SEXTANTS.

No. 544,212.

Patented Aug. 6, 1895.

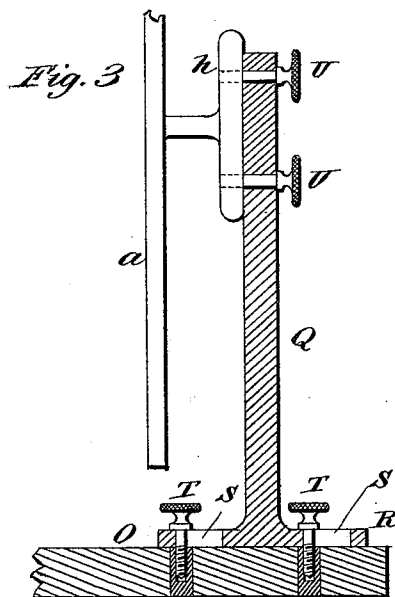


Fig. 6

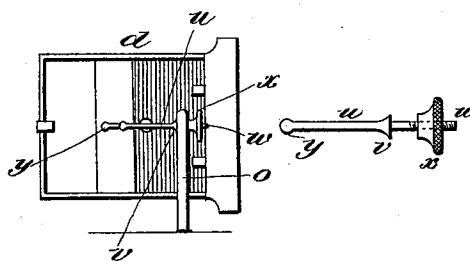


Fig. 7

Fig. 4

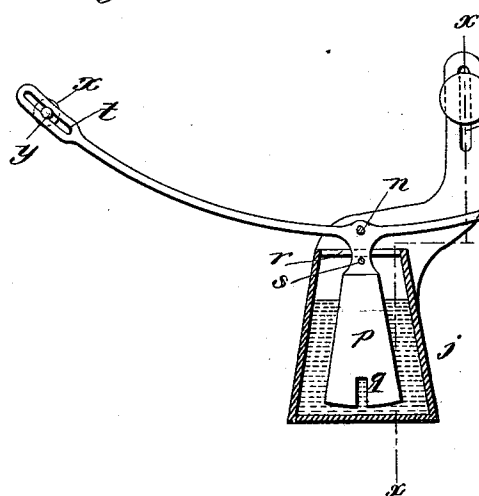


Fig. 5

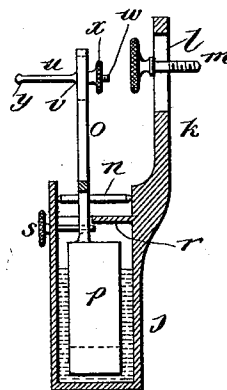
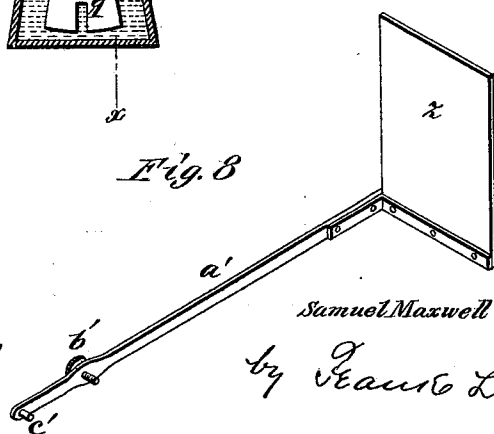


Fig. 8



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UNITED STATES PATENT OFFICE.

SAMUEL MAXWELL WEST CROSKERY, OF ROCKFERRY, ENGLAND.

ATTACHMENT FOR SEXTANTS.

SPECIFICATION forming part of Letters Patent No. 544,212, dated August 6, 1895.

Application filed April 12, 1895. Serial No. 545,495. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL MAXWELL WEST CROSKERY, a subject of the Queen of Great Britain, residing at Rockferry, in the
5 county of Chester, England, have invented certain new and useful Improvements in Attachments for Sextants; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will
10 enable others skilled in the art to which it appertains to make and use the same.

My invention relates to various new and useful improvements in sextants, and more particularly to an improved manner of mounting
15 the instrument for use in heavy weather, and further to a novel construction of artificial horizon which can be quickly attached to and removed from the sextant.

The objects of the invention are to provide
20 an improved form of support to which an ordinary sextant may be applied for sustaining the instrument in heavy weather, when the vessel is rolling or pitching too severely to allow the instrument to be properly used
25 when held by hand in the usual way, and to provide and produce an improved construction of artificial horizon which can be easily applied to any form of sextant and which will be simple in construction and absolutely
30 accurate in operation, both in the day-time and at night.

An artificial horizon is of especial advantage for use with sextants when the natural horizon is obscured and the sun or stars are
35 visible, as is frequently the case in the North Atlantic ocean, where low dense fogs are prevalent during the summer months.

In order that my invention may be understood, attention is directed to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a sectional view of the entire device; Fig. 2, an enlarged front elevation of a well-known form of sextant, showing my
45 improved artificial horizon applied thereto; Fig. 3, an enlarged cross-sectional view of a portion of the sextant-support, showing the sextant applied thereto; Fig. 4, an enlarged side elevation, partly in section, of the improved artificial horizon; Fig. 5, a cross-sectional view on the line *xx* of Fig. 4; Fig. 6,
50 an enlarged view of the horizon-glass, showing

the two sights and illustrating its appearance when a star has been brought down to the horizon. Fig. 7 is an enlarged detached view of one of the sights, and Fig. 8
55 is a perspective view of the screen to be used with the device at night.

In all of the above views corresponding parts are designated by the same letters of
60 reference.

A represents a suitable casing, made preferably four or five feet in height, and of wood or metal. This casing is preferably carried
65 on the bridge or some other exposed place of the vessel.

B B are two rings one within the other, and supported on suitable knife-edge bearings C, so as to form ordinary gimbals, such
70 as are used for supporting compasses. Secured to the inner ring B and extending down within the casing A is a vessel D of any suitable depth.

E is a gimbal-ring mounted within the inner ring B on knife-edge bearing-pieces F,
75 and mounted within this gimbal-ring E, on similar bearing-pieces, is a disk G. This disk G is provided with a depending integral sleeve H, having a screw-threaded opening therein for receiving a rod I, which carries a
80 weight J at its lower end, which weight J, as will be understood, will be suspended within the vessel D. Glycerin, oil, or any other viscid liquid is supplied to the vessel D, so as to
85 immerse the weight J, to prevent violent movement of the latter when the vessel rolls or pitches.

The disk G is provided on its upper side with a shoulder K, to which a metal disk L of
90 larger diameter than the disk G is secured by means of machine-screws M or in any other way. The disk L is provided at its center with a bearing-pin N, made preferably conical, and mounted on this bearing-pin is a
95 table O, preferably of about the same diameter as the top of the casing A, and which may be conveniently made of wood. This table O, being mounted on the pin N, is free to turn upon the disk L, and if desired, any approved
100 form of bearing, such as balls or rollers, may be interposed between the moving parts.

A set screw P engaging the bearing pin N may be employed to prevent the table O from becoming accidentally unseated. Q is a ver-

tical standard extending tip from the table O at one side of the bearing pin N, and provided with an integral support or base R. This base R is provided with slotted openings S therein, through each of which extends a screw T, engaging in the table O. By making the openings for these screws slotted, as shown, the position of the standard Q with respect to the center of the table may be adjusted so as to balance sextants of different weights.

The sextant, which will be presently described, is adapted to be removably secured to the standard Q by means of thumb-screws U, or in any other suitable way. Such a support for the sextant as I have above described is particularly adapted for use during very rough weather when the vessel is pitching or rolling heavily, although it may be employed for supporting the sextant at all times. It will be observed that the table O, which carries the sextant, may be turned on the pin N, so as to be pointed toward the sun or star from which the observation is to be taken, and that said support is mounted practically in two sets of gimbals, each set being entirely independent of the other. By mounting the vessel D, which carries oil at its lower end, in gimbals B B, said receiving-vessel will always be kept practically vertical, and by mounting the table O in other gimbals E and G the sextant at all times will be entirely uninfluenced by movements of the vessel, the steadiness thereof being very materially increased by immersing the weight J in oil, as explained.

Referring to Figs. 2, 3, 4, 5, 6, and 7 the construction of my improved artificial horizon and manner of applying the same to a sextant will be readily understood.

a represents the plane or body of an ordinary form of sextant.

b is the silvered index-glass, which is usually provided with screws for its adjustment.

c are the fore shades or screens of colored glass.

d is the horizon-glass, supported in a frame in the usual way, one side of which is silvered as shown in Fig. 6.

e are the back shades or screens of colored glass, which are used to prevent the eyes from being injured by the glare of the sun.

f is the radius, which carries the index-glass *b* at its upper end and which works along the scale *g*. The radius *f* is generally provided at its lower end with a vernier to enable accurate adjustments to be taken. A handle *h* is secured to the back of the plane *a*, and is attached by means of the set-screws U to the standard Q when it is desired to support the sextant, as explained.

i is the telescope, which is useful for obtaining accurate results on the natural horizon, but which is not necessary when my improved artificial horizon is used, an ordinary tube being suitable for this purpose.

Referring to Figs. 4 and 5, *j* represents a

small metallic vessel made preferably of the general form shown. *k* is a short bracket-arm formed on the back of the vessel *j*, and having a slot *l* therein. *m* is a set-screw engaging with the frame of the sextant and passing through this slot *l*, whereby the position of the vessel *j* can be quickly and easily adjusted.

n is a small shaft having very fine bearings formed in the front and back of the vessel *j*. If desired, the ends of this shaft *n* may be worked in jewels to prevent wear.

o is a curved arm carried on the shaft *n*, and with its free ends about in line with the center of the horizon-glass *d*. One end of this arm *o* is in front of the horizon-glass and the other end is behind the horizon-glass, as will be seen. Instead of making use of the curved arm *o* it is obvious that a straight horizontal arm having vertical extensions at each end may be employed.

p is a heavy weight depending from the shaft *n* and working within the vessel *j*. Glycerin or oil is poured in the vessel *j*, as shown, so as to immerse the lower end of the weight *p*. A notch *q* is formed in the bottom of the weight *p*, so as to afford a greater resistance to the weight in its movement through the liquid in the vessel. A partition *r* is provided at the upper part of the vessel, directly beneath the shaft *n*, so that when the sextant is laid on its side the liquid in the vessel *j* will not escape.

s is a set-screw working in the front piece of the vessel *j* for engaging with the weight *p* or with the shank which supports the weight *p* when the device is not in use, to prevent the weight from swinging unnecessarily.

Each end of the curved arm *o* is provided with a slot *t* therein, and engaging in each of said slots is a sight *u*. Each sight *u* is provided with a shoulder *v*, with a screw-threaded portion *w*, with which a thumb-nut *x* engages, and the point of the sight is coated with phosphorus luminous paint, which appears, as on the drawings, like a head or ball, or is illuminated in any other way.

The sight *u* adjacent to the telescope *i* is shorter than the other sight, whereby the two heads *y y* will appear to be side by side, as shown in Fig. 6.

When the device is to be used at night it is desirable to employ a screen *z*, covered with lampblack or otherwise suitably blackened, so that the luminous heads *y y* will be sharply defined. This screen *z* is removably secured, preferably, to the front side of the vessel *j* by means of a supporting-arm *a'*, held in place by a set-screw *b'*. The end of the arm *a'* opposite to the screen *z* is provided with a pin *c'*, which engages in a recess in the front of the vessel *j* and which serves to steady the arm *a'*.

The operation of my improved artificial horizon is as follows: The device must be first adjusted to the natural horizon, which is accomplished by supporting the device in as rigid a position as possible, preferably by

means of the support shown in Fig. 1, and by so adjusting the sights *u* in the slots *t* that both of said sights will be in line with the horizon. When this is done the device needs
 5 no further adjustment or attention, because the weight *p* will always keep the sights *y y* in line with the horizon, and when the natural horizon is obscured the operator is certain that these sights *y y* indicate with absolute accuracy the natural horizon. The sextant is therefore held in such a position that the heads *y y* will appear to be side by side, as shown in Fig. 6, and the sun is brought
 10 down on the silvered portion of the horizon-glass until the lower end of its reflected image is in line with the sights *y y*.

When the device is to be used at night for taking the altitude of a fixed star the screen *z* is employed, so that the illuminated heads
 20 or sights *y y* will be sharply defined and will be side by side. The star is then brought down in the same way until it is defined on the silvered portion of the horizon-glass in line with the heads *y y*. I find that in actual
 25 practice by coating the heads *y y* with phosphorus they are defined very sharply, so that when a fixed star is brought down in line with them the appearance of three stars side by side is produced.

30 It is of course obvious that my improved artificial horizon may be applied to quadrants or to other instruments wherein the position of the natural horizon must be found.

Having now described my invention, what I
 35 claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination of a casing *A*, a vessel *D* mounted in gimbals at the top of said casing; a disk *G* mounted in gimbals at the top
 40 of said vessel; a weight *J* carried by said disk and immersed in a liquid within said vessel; a bearing spindle *N* at the top of said disk *G*; a revolving table *O* mounted on said bearing spindle; and a sextant carried by said revolving
 45 table, substantially as set forth.

2. The combination of a casing *A*, a vessel *D* mounted in gimbals at the top of said casing; a disk *G* mounted in gimbals at the top
 50 of said vessel; a weight *J* carried by said disk *G* and immersed in a liquid within said vessel; a bearing spindle *N* carried by said disk

G; a revolving table *O* mounted on said bearing spindle *N*; a standard *Q* adjustably mounted on said table *O*; and a sextant removably secured to said standard *Q*, substantially as set forth. 55

3. The combination with a sextant, of an artificial horizon removably attached thereto, comprising two sights supported in a horizontal plane, said sights being of different
 60 lengths and having enlarged outer ends or heads, whereby said enlarged outer ends or heads will appear side by side when in operation, substantially as set forth.

4. The combination with a sextant, of an artificial horizon attached thereto, comprising two sights supported in a horizontal plane, one on each side of the horizon glass of the sextant, said sights being of different lengths
 65 and having enlarged outer ends or heads, whereby said enlarged outer ends or heads will appear side by side when in operation, substantially as set forth. 70

5. The combination with a sextant of a removable artificial horizon attached thereto, and comprising two luminous sights in a horizontal plane; and a blackened screen supported behind said luminous sights, substantially as set forth. 75

6. The combination with a sextant of a removable artificial horizon attached thereto, comprising two luminous sights in a horizontal plane, and a removable blackened screen behind said sights, substantially as set forth. 80

7. The combination with a sextant of a removable artificial horizon attached thereto, comprising a vessel *j*; a curved arm *o* pivoted at the top of said vessel; a sight adjustably secured to each end of said curved arm; a
 85 weight *p* within said vessel for keeping said sights in a horizontal plane; a recess *q* in said weight; a liquid in said vessel in which the weight *p* is partly immersed; and a partition *r* at the top of said vessel, substantially as set forth. 95

This specification signed and witnessed the 3d day of April, 1895.

SAMUEL MAXWELL WEST CROSKERY.

Witnesses:

JOHN THORPE,

JAS. S. THORNTON.